Partial Translation of JP 11181391

[Claims]

[Claim 1] An adhesive composition comprising a cationic polymerization material (A), an energy-line cationic polymerization initiator (B) and a cationic polymerization retarder (C).

[Claim 2] The adhesive composition according to Claim 1, wherein the cationic polymerization material (A) is a mixture of a glycidyl compound (A1) and an alicyclic ether compound (A2).

[Claim 3] The adhesive composition according to Claims 1 and 2, wherein the cationic polymerization retarder (C) is at least 1 compound selected from organoaluminium compounds, organotitanium compounds, organozinc compounds, organophosphorous compounds and organoantimony compounds.

[Claim 4] A bonded article consisting of a hardened layer of the adhesive composition according to any of Claims 1 through 3.

[Claim 5] The bonded article according to Claim 4 wherein the bonded article is an optical disc.

[Claim 6] The bonded article according to Claim 5 wherein the optical disc is a DVD.

[Claim 7] The bonded article according to Claim 4 wherein the bonded article is an IC card.

[Claim 8] A bonding method, which is characterized in that each of two base materials, or the surface of one of them, is painted with the adhesive composition, according to any of Claims 1 through 3, said painted surface is irradiated with an energy line at a quantity that does not form a hardened film, and then both painted surfaces, or the painted surface and the surface of the other base material, which is not painted with the adhesive composition, are bonded.

[Claim 9] A method of manufacturing optical discs, which is characterized in that the adhesive composition, according to any of Claims 1 through 3, is painted onto the recording layers of an optical disc substrate or, if said recording layers are covered with a protective layer, onto the protective layers, said painted surfaces are irradiated with an energy line at a quantity that does not form a hardened film, and then both painted surfaces are bonded.

[0006] The adhesive composition pertaining to the present invention comprises a cationic polymerization material (A), an energy-line cationic polymerization initiator (B) and a cationic polymerization retarder (C). Examples of the cationic polymerization material (A) include a glycidyl compound (A1) and an alicyclic ether compound (A2).

[0007] Examples of the glycidyl compound (A1) include glycidyl ester compounds such as glycidyl esters of linoleic acid dimers and glycidyl ether compounds, of which glycidyl ether compounds are recommended. Of these, 1 or 2 or more types of glycidyl compounds can be mixed and used.

[0009] The alicyclic ether compound (A2) should be an alicyclic ether compound other than glycidyl compound, and examples thereof include epoxy compounds of alicyclic hydrocarbons and compounds containing an oxetane ring. Examples of epoxy compounds of alicyclic hydrocarbons include cyclic aliphatic compounds (hereinafter, "alicyclic epoxy compounds").

[0011] Moreover, examples of alicyclic ether compound containing an oxetane ring include 3-methyl-3-hydroxymethyloxetane and 1,4-bis [(3-ethyl-3-oxetanylmethoxy) methyl] benzene.

[0014] In the composition pertaining to the present invention it is recommended to combine and use the above-mentioned glycidyl compound (A1) and the above-mentioned alicyclic ether compound (A2).

[0018] In the present invention, a cationic polymerization retarder (C) is used. The main function of this cationic polymerization retarder (C) is to inhibit formation of a hardened film after the adhesive composition pertaining to the present invention is painted onto the base material and subjected to energy line irradiation. Examples of the (C) constituent include organometallic compounds such as organoaluminium compounds, organotitanium compounds and organozinc compounds, which are complex compounds in which an alkoxy group, phenoxy group, acyloxy group, β-diketonato group or o-carbonylphenolate group is bonded with a metal atom selected from aluminium, titanium or zinc.

[0020] Moreover, in the present invention, organophosphorus compounds or organoantimony compounds, which are compounds in which a phenyl group, alkyl group or the like is bonded with a metal atom selected from phosphorus or antimony., can also be used as the cationic polymerization retarder (C).

[0026] The contents of constituents (A) through (C), which constitute the adhesive composition pertaining to the present invention, in relation to the total quantity of the three, is as follows. The content of constituent (a) should be between 90 and 99.95 wt%, preferably between 95 and 99.9 wt%, the content of constituent (B) should be between 0.025 and 5 wt%, preferably between 0.05 and 3 wt%, and the content of constituent (C) should be between 0.025 and 5 wt%, preferably between 0.05 and 4 wt%.

[0027] The adhesive composition pertaining to the present invention can comprise compound (D), whose molecule contains at least two hydroxyl groups, a lactone compound (E) and a filler (F). Although the compound (D), whose molecule contains at least two hydroxyl groups, and the lactone compound (E), are used mainly to adjust the

cure rate and to increase the flexibility and adhesive strength of the coat, from the viewpoint of the stability over time (pot life) of the adhesive composition, it is recommended to use the compound (D), whose molecule contains at least two hydroxyl groups. In addition, the filler (F) is used mainly to impart or improve thixotropy.

[0028] The compound (D), whose molecule contains at least two hydroxyl groups, should preferably have no acidic groups other than phenolic hydroxyl groups. Examples include polyol compounds with no functional groups other than alcoholic hydroxyl groups (D-1), polyester polyol compounds (D-2), polycaprolactone polyol compounds (D-3), polyol compounds with phenolic hydroxyl groups (D-4), polycarbonate diols and other polycarbonate polyols. By using a compound (D) whose molecule contains at least two hydroxyl groups, the formation of a coat on the surface of the paint film after irradiation with an energy line can be better suppressed, and adhesiveness of the surface prevented, yielding an adhesive whose laminated surface does not become uneven. In addition, the bonded article in which the adhesive pertaining to the present invention was used can thereby be imparted with higher shock resistance.

[0034] Examples of the filler (F) include commonly-used fillers such as silicon dioxide, titanium dioxide, alumina, barium sulfate, kaolin, talc, clay, calcium carbonate, bentonite, glass fiber, carbon fiber, mica and organic fillers (such as resin beads).

[0036] In addition, if constituent (D) is used in addition to the above-mentioned constituents (A) through (C), their contents, for a total quantity of 100 weight parts of (A), (B) and (D), are as follows. The content of (a) should be between 5 and 50 weight parts, preferably between 10 and 30 weight parts, the content of (B) should be between 5 and 90 weight parts, preferably between 10 and 70 weight parts, the content of constituent (D) should be between 5 and 50 weight parts, preferably between 10 and 40 weight parts, and the content of constituent (C) should be between 0.1 and 10 weight parts, preferably between 0.05 and 5 weight parts, and ideally between 0.1 and 1 weight parts. Moreover, if constituent (F) is used, its content should be between 1 and 60 weight parts, preferably between 5 and 40 weight parts.

[0037] To the composition pertaining to the present invention can be added, as needed, a cationic polymerization material other than constituent (A), (meta)acrylate compound, UV absorbent, antioxidant, leveling agent, defoaming agent and the like. Examples of a cationic polymerization material other than constituent (A) include n-butylvinyl ether, cyclohexyl vinyl ether, butanediol-divinyl ether, triethylene-glycol divinyl ether, cyclohexane dimethylol divinyl ether and trimethylol propane trivinyl ether and other vinyl ether compounds. Examples of the (meta)acrylate compound include epoxy(meta)acrylate and other (meta)acrylate oligom and (meta)acrylate monomer, and the like.

[0039] The bonded article pertaining to the present invention is comprised of two base materials, bonded via a hardened layer of the above-mentioned adhesive composition. The thickness of the hardened layer should be, for example, between 5 and 100 μm. Although no special restrictions are placed on the base materials, in ord r to take full

advantage of the function of the above-mentioned adhesive composition, it is recommended to use base materials which are substantially not penetrated by a normal energy line with a wavelength between 280 and 380 nm, such as an optical disc substrate, consisting of a polycarbonate base material and a recording layer made of a spatter film of metal such as alumina. The two base materials may be identical or different.